

REMARKS

In view of the foregoing amendments and following remarks responsive to the Office Action dated August 13, 2004, Applicant respectfully request favorable reconsideration of this application.

In section 1 of the Office Action, the Office objected to the disclosure, stating that related application number 09/822,967 is not mentioned in the specification. Applicant respectfully traverses. Applicant is unaware of any requirement in the statute or regulations to mention other patent applications in a patent specification. Applicant is not necessarily averse to adding such a reference. However, it is unclear why, where and how to do this or what can or should be said about the application without introducing new matter.

In section 2 of the Office Action, the Office objected to the drawings noting that certain reference characters mentioned in the description are not shown in Figure 2. Due to a clerical error, Figure 2 submitted in this application is not the Figure 2 that is described in the specification. Therefore, Applicant herein submits an entirely new replacement Figure 2 that matches the description in the specification. No new matter is being introduced since Figure 2 is merely a flow diagram of exactly what is described in the specification.

In section 3 of the Office Action, the Office objected to claim 21 because it should depend from claim 18, rather than claim 17. Applicant has amended claim 21 accordingly.

In sections 4, 5, and 5 of the Office Action, the Office purports to reject claims 17, 19, and 20 as indefinite under 35 U.S.C. section 112. However, there clearly is some

IN THE DRAWINGS

In accordance with the Examiner's request, Applicant submits herein an entirely new replacement sheet for Figure 2 which is in compliance with 37 C.F.R. §1.84(p)(5) and which reflects the reference characters 213, 215, 217, 232, 234-240, and 242 mentioned in the description.

typographical error in connection with this rejection in that there is no description of a rejection of claims 19 and 20. On the other hand, there is no statement that claim 17 is being rejected, yet section 6 indicates that the limitations "said JVM's" and "said HTTP session objects" appearing in claim 17 lack antecedent basis. Thus, Applicant will assume herein that this is intended to be a rejection of claim 17 only for lacking antecedent basis for the aforementioned claim limitations and that the Office does not intend to reject claims 19 and 20 under 35 U.S.C. section 112. Applicant has herein corrected this claim 17 to depend from claim 14 rather than directly from claim 11 to correct this problem.

The Present Invention

Web sites often divide the tasks of servicing requests into a three tier system with a different server or plurality of servers to handle each tier. The first, front end tier is the http server that processes the http aspects of a transaction. The second tier is the application servers. The application server handles the content specific processing for the transactions. The third tier comprises database servers that store the data needed to process requests. Within each tier, the Web site server system may have multiple, redundant servers. Particularly, any given server can only service so many requests in a given period. If the Web site expects more traffic than a single server can handle, it simply maintains multiple servers which can serve the same content. In such situations, since http is a connectionless protocol, one request from a particular client can be directed to one application server while the next request from the same client machine might be directed to a different application server. Accordingly, a means must be

provided for the various servers to access the session data developed by another, redundant server.

A common way of enabling such sharing of http session data is by use of a database server that is accessible to the plurality of application servers for storing session data. Particularly, an application server will store session data in local memory, but will also write a copy of the session data to the session database. If a different server services a request from a client, that different server can go to the database and read the session data for the corresponding session.

In the prior art, the session data for a session is updated in both the local memory and the database each time a request causes a change in the data. Writing to the database is a relative expensive process in terms of consumption of processing power and time. Accordingly, the present invention is designed to reduce the number of writes to an http session database in order to conserve system resources.

The invention pertains to a method and apparatus for updating a session database that is accessible by multiple servers in a Web environment. In accordance with the invention, each server maintains http session data in a local memory. This copy of the http session data will be updated every time there is a change in the session data. The servers write a copy of the session data to a common database shared by all of the servers automatically at designated times. In a preferred embodiment of the invention, the designated time is periodic. In alternate embodiments, the servers may write the session data to the database after a specified number of requests in that session have been received. In another embodiment, the servers may write the session

data to the database after a specified number of changes to the session data have been made.

Prior Art Rejections

In section 8 of the Office Action, the Office rejected claims 11-13, 16, and 17 under 35 USC section 103 (a) as unpatentable over Abramson in view of Feit. In short, the Office asserted that Abramson teaches almost all of the limitations of independent claim 11, including the limitation of “writing a copy of said data for each said session stored in said local memory into a central memory accessible to all servers of said server systems at designated times”. The Office concedes that Abramson does not teach that the designated times are a function of a predetermined time interval since a last write to the database of data for said sessions. The Office further asserted that Feit teaches session control for HTTP communications over the Internet and the use of time intervals. The Office, therefore, concluded that it would have been obvious to modify Abramson in view of Feit to use predetermined time intervals because it would avoid writing a copy of the data too often.

Applicant respectfully traverses. In particular, contrary to the Office’s assertions, Abramson does not teach writing a copy of the session data to the central memory at designated times nor does Feit teach anything relevant about using time intervals for such writes.

With respect to Abramson, the Office asserted that Abramson column 4, lines 5-16 teaches writing the session data to central memory at designated times. This is not accurate. Overall, Abramson teaches nothing significantly different from what is

described as prior art in the background section of the present application. Column 4, lines 5-16 of Abramson merely describe the type of data that is maintained as session data. This portion of Abramson is not even the portion that discusses writing that session data to the back-up server. There is no mention in this portion of Abramson of when or how that session data is written to the back-up server. There is nothing in Abramson that suggests that Abramson is doing anything different from what is described in the background section of the present application in connection with how and when it writes the session data to the back-up server. Accordingly, it does not teach writing session data to the backup server “at designated times” as claimed in claim 11.

Furthermore and in any event, Feit does not teach anything relevant to the present invention. With respect to the relevance of Feit in connection with claim 11, the Office states nothing more than “Feit teaches the use of time intervals (col. 6, lines 7-13)”. Applicant certainly does not dispute that “the use of time intervals” is known in the prior art”. The insufficiency with the rejection is that Feit’s use of time intervals has absolutely nothing to do with the sessions discussed in Abramson or the present invention. In fact, it seems apparent that the technology disclosed in Feit was developed prior to the existence of the type of Java sessions or session data that is the subject of the present invention. In fact, Feit discusses at great length that there is no technology available for the Internet for maintaining anything like the session data that is the subject of the present invention. (See col. 1, line 65 – col. 2, line 51 of Feit). In Feit’s terminology, an Internet “session” comprises a single http request and response (col. 2, lines 15-17).

The problem that Feit addresses is the desire to know when a true session (as that term is used in the present application) between a client and server is terminated. Apparently, at the time the technology described in Feit was developed, there was no true session data on the Internet. If there was, this would not be a problem since the Java http session data includes exactly this information.

The technology disclosed in Feit that the Office considers to be relevant is the “heart beat” feature described therein. In accordance with this feature, when a client requests a page from a server, the server delivers the page including extra code that will cause the client to send a heart beat back to the server at defined intervals. In turn, the server will send a message back to the client in response to the heart beat indicating that it has received the “heart beat”. This will continue until the client closes the page, i.e., ends the session. The server, in the meantime, keeps a record of the number of heartbeats it receives from that page at the client. When the server realizes that it has not received an expected “heart beat”, it assumes the session has been closed. It then determines the approximate length of the session by counting the number of heartbeats it received from the page.

This technology has absolutely nothing to do with the present invention or Abramson and teaches nothing pertinent to the present invention. Feit teaches nothing about writing session data to a back end server. There is no mention of a back end server in Feit. The time interval between “heart beats” that the Office is relying on is the time interval between client machine writes to the front end server. This is of utterly no relevance to the present invention, which concerns writing session data between a server and a database in a separate server. Feit is no more relevant to the present

invention or Abramson than an alarm clock because the extent of its relevant teaching is doing something of no relevance to the present invention at predetermined intervals.

Feit no more suggests to a person of ordinary skill in the art the concept of modifying Abramson to write session data to the central database at designated times that are “a function of a predetermined time interval since a last write to said database of data for said session” than does an alarm clock.

Referring to independent claim 11, Abramson in combination with Feit do not teach or suggest “writing a copy of said data for each said session stored in said local memory into a central memory accessible to all servers of said server system at designated times, said designated times being a function of AP determined time interval since a last write to said database of data for said sessions”.

Since claims 12, 13, 16, and 17 depend from claim 11, they distinguished over the prior art for at least the same reasons. Furthermore, claim 17 recites the step of “polling said session objects stored in said memories local to said JVMs to determine if they have been updated since the last time step (2) was performed” or that “only copies said HttpSession objects that have been updated within said predetermined time interval are written to said database”. The Office asserted that this is taught in col. 6, lines 24-30 and column 6, lines 50-67 of Abramson. However, column 3, lines 24-30 discuss load distribution among servers and has nothing to do with session data whatsoever. Column 6, lines 50-67 does discuss the writing of session data to the backup server, but does not appear to disclose anything remotely resembling polling of application servers or selectively writing HttpSession objects.

The Office rejected claim 14 as obvious over Abramson and Feit further in view of Prabandham. However, Prabandham teaches nothing that was lacking from Abramson and Feit as discussed above in connection with claim 11, from which claim 14 depends. Accordingly, claim 14 also distinguishes over the prior art of record for the reasons set forth above in connection with claim 11.

The Office further rejected claims 1-10, 15, 18, 22, and 23 under 35 USC section 103(a) as unpatentable over Abramson, Feit, and Prabandham and further in view of Ng. However, once again, independent claim 1 recites “a second computer program adapted to write to said database a copy of said HTTP session data for each said HTTP session at a designated time that is a function of a predetermined time interval since the last write to said database of http session object data for said http session”.

Accordingly, claim 1 distinguishes over the prior art at least for all of the same reasons given above in connection with independent claim 11. Ng does not disclose the teachings lacking from the other references discussed above.

Likewise, independent claim 18 recites “a second computer program adapted to write a copy of said http session data for each said http session in said database at designated times, said designated times determined as a function of at least one of (a) the number of times the http session object data is updated in said local memory and (b) the number of times said http request in said http session is serviced”. It should be clear at this point from the discussions above of independent claims 11 and 1 that the references do not teach these limitations.

In view of the foregoing amendments and remarks, this application is now in condition for allowance. Applicant respectfully requests the Examiner to issue a Notice

of Allowance at the earliest possible date. The Examiner is invited to contact Applicant's undersigned counsel by telephone call in order to further the prosecution of this case in any way.

Respectfully submitted,

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